

ARCHITECTURAL ENGINEERING - MINOR

The undergraduate minor in architectural engineering serves CU Boulder students who are interested in building science, engineering and systems design.

Architectural engineering is the application of engineering principles and technology to building design and construction. Architectural engineering combines aspects of electrical, mechanical and civil engineering to design integrated systems for buildings. Building systems include heating, ventilating and air conditioning (HVAC) systems; illumination and electrical systems; material and structural systems; and construction methods applied to buildings.

Requirements

Admission Requirements

A cumulative GPA of 2.750 or higher is required to be admitted to the minor.

The minor is not open to students pursuing the Bachelor of Science in Architectural Engineering or the Bachelor of Science in Integrated Design Engineering with an architectural engineering disciplinary emphasis. In addition, the structural systems and construction engineering and management tracks (shown below) are not open to students pursuing the Bachelor of Science in Civil Engineering or the Bachelor of Science in Integrated Design Engineering with a civil engineering disciplinary emphasis.

Prerequisites

The following prerequisite courses are required, with a grade of C- or higher in each. A student may be accepted into the minor with no more than two of these courses as deficiencies. All deficiencies must be completed before the minor is awarded.

- Calculus 1 (APPM 1350, MATH 1300 or APPM 1345)
- Calculus 2 (APPM 1360 or MATH 2300)
- Calculus 3 (APPM 2350 or MATH 2400)
- Differential Equations and Linear Algebra (APPM 2360 , or MATH 2130 and MATH 3430)
- Two semesters of calculus-based physics (PHYS 1110 or PHYS 1115, and PHYS 1120 or PHYS 1125)
- Statics (CVEN 2121 , ASEN 2701 , GEEN 2851 or MCEN 2023)

Program Requirements

Grade Requirements

A cumulative GPA of 2.000 is required in the courses used to satisfy the minor requirements, with no individual grade lower than C-.

Residency

The minor requires 18 credit hours, at least nine of which must be AREN/ CVEN courses completed on the CU Boulder campus. The minor is composed of three required courses, two courses in a single track, plus one elective course.

Course Requirements

Code	Title	Credit Hours
Required Core Courses		
AREN 2050	Building Materials and Systems	3
CVEN 3246	Introduction to Construction	3
CVEN 3161 or MCEN 2063	Mechanics of Materials 1 Mechanics of Solids	3
Tracks		6
Choose one:		
<i>Mechanical Systems Track</i>		
AREN 3010	Energy Efficient Buildings	
AREN 4110	Building Energy Systems Engineering	
<i>Structural Systems Track</i> ¹		
CVEN 3525	Structural Analysis	
CVEN 4545 or CVEN 4555 or CVEN 4565	Steel Design Reinforced Concrete Design Design of Wood Structures	
<i>Electrical Systems Track</i>		
AREN 3040 or ECEN 2250 or ECEN 3010 or GEEN 3010	Circuits for Architectural Engineers Introduction to Circuits and Electronics Circuits and Electronics for Mechanical Engineers Circuits for Engineers	
AREN 4570	Building Electrical Systems Design 1	
<i>Lighting Track</i>		
AREN 3540	Illumination I	
AREN 4550	Illumination 2	
<i>Construction Engineering & Management Track</i> ¹		
AREN 4506	Pre-construction Estimating and Scheduling	
AREN 4606	Construction Project Execution and Control	
Elective		3
ARCH 3214	History and Theory of Architecture 2	
AREN 1027	Engineering Drawing	
CVEN 1027	Civil Engineering Drawing	
ENVD 2352	Beginning Digital Applications ²	
AREN 4010	Energy System Modeling and Control	
AREN 4130	Optical Design for Illumination and Solid State Lighting	
AREN 4315	Design of Masonry Structures	
AREN 4530	Advanced Lighting Design	
AREN 4560	Luminous Radiative Transfer	
AREN 4580	Daylighting	
AREN 4830	Special Topics for Seniors/Grads (Sustainable Lighting Workshop, Computer Simulation of Building Systems, or Forensic Engineering)	
AREN 4890	Sustainable Building Design	
AREN 4990	Compu Fluid Dynamics (CFD) Analysis for Built/Natural Envmnts	
AREN 5020	Building Energy Audits	
AREN 5050		
AREN 5070		

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CVEN 5830 Special Topics for Seniors/Grads
(Distributed Generation Systems, Color
Theory/Light Source, or Applied Data
Analysis & Modeling)

AREN 5660 Embodied Carbon in Buildings

AREN 5090 Optimizing Grid Connected Systems

Total Credit Hours

18

¹ Not open to students pursuing the Bachelor of Science in Civil Engineering or the Bachelor of Science in Integrated Design Engineering with a civil engineering disciplinary emphasis.

² Only the Intro 3-D Modeling (RHINO) and INTRO BIM (Revit) sections are approved as an elective.